

## CLAIMS

What is claimed is:

5 1. A method for selecting routing information to be provided to devices in a communication network, comprising:

obtaining routing information describing a plurality of routes between forwarding devices of said communication network, wherein said plurality of routes is deadlock free, and wherein  
10 said routing information includes a plurality of alternative routes;

selecting one of said plurality of alternative routes, wherein said selecting optimizes a performance metric; and

delivering said selected one of said plurality of  
15 alternative routes to at least one forwarding device in said communication network.

2. The method of claim 1, wherein said performance metric is network capacity.

20 3. The method of claim 2, wherein said step of selecting one of said plurality of alternative routes further comprises:

determining a first set of data flows between end nodes attached to said communication network, wherein said first set of  
25 data flows is determined, at least in part, responsive to a first one of said alternative routes;

determining, responsive to said first set of data flows, a first standard deviation, wherein said first standard deviation describes a distribution of said first set of data flows across  
30 links in said communication network;

determining a second set of data flows between end nodes attached to said communication network, wherein said second set of

data flows is determined response to a second one of said alternative routes;

determining, responsive to said second set of data flows, a second standard deviation, wherein said second standard deviation describes a distribution of said second set of data flows across links in said communication network;

comparing said first standard deviation and said second standard deviation;

selecting said first one of said alternative routes in the event that said first standard deviation is lower than said second standard deviation; and

selecting said second one of said alternative routes in the event that said second standard deviation is lower than said first standard deviation.

4. The method of claim 1, wherein said performance metric is fault tolerance.

5. The method of claim 4, wherein said step of selecting one of said plurality of alternative routes comprises:

determining a first difference measure, said first difference measure reflecting a number of differing links between a first pair of said alternative routes;

determining a second difference measure, said second difference measure reflecting a number of differing links between a second pair of said alternative routes;

comparing said first difference measure and said second difference measure;

determining a selected pair of said alternative routes, wherein said selected pair of said alternative routes comprises said first pair of said alternative routes in the event said first difference measure is greater than said second difference measure, and wherein said selected pair of alternative routes comprises

said second pair of alternative routes in the event said second difference measure is greater than said first difference measure; and

designating a first one of said selected pair of said  
5 alternative routes as an enabled route, and designating a second one of said selected pair of said alternative routes as a backup route.

6. The method of claim 5, further comprising:

10 detecting a failure of said enabled route; and  
replacing said enabled route with said backup route.

7. A system for selecting routing information to be provided to  
15 devices in a communication network, comprising routing logic operable to:

obtain routing information describing a plurality of routes  
between forwarding devices of said communication network, wherein  
said plurality of routes is deadlock free, and wherein said  
routing information includes a plurality of alternative routes;

20 select one of said plurality of alternative routes, wherein  
said selecting optimizes a performance metric; and

deliver said selected one of said plurality of alternative  
routes to at least one forwarding device in said communication  
network.

25 8. The system of claim 7, wherein said performance metric is  
network capacity.

9. The system of claim 8, wherein said routing logic is further  
30 operable to:

determine a first set of data flows between end nodes  
attached to said communication network, wherein said first set of

data flows is determined, at least in part, responsive to a first one of said alternative routes;

determine, responsive to said first set of data flows, a first standard deviation, wherein said first standard deviation describes a distribution of said first set of data flows across links in said communication network;

determine a second set of data flows between end nodes attached to said communication network, wherein said second set of data flows is determined response to a second one of said alternative routes;

determine, responsive to said second set of data flows, a second standard deviation, wherein said second standard deviation describes a distribution of said second set of data flows across links in said communication network;

compare said first standard deviation and said second standard deviation;

select said first one of said alternative routes in the event that said first standard deviation is lower than said second standard deviation; and

select said second one of said alternative routes in the event that said second standard deviation is lower than said first standard deviation.

10. The system of claim 8, wherein said performance metric is fault tolerance.

11. The system of claim 10, wherein said routing logic is further operable to:

determine a first difference measure, said first difference measure reflecting a number of differing links between a first pair of said alternative routes;

determine a second difference measure, said second difference measure reflecting a number of differing links between a second pair of said alternative routes;

compare said first difference measure and said second difference measure;

determine a selected pair of said alternative routes, wherein said selected pair of said alternative routes comprises said first pair of said alternative routes in the event said first difference measure is greater than said second difference measure, and wherein said selected pair of alternative routes comprises said second pair of alternative routes in the event said second difference measure is greater than said first difference measure; and

designate a first one of said selected pair of said alternative routes as an enabled route, and designating a second one of said selected pair of said alternative routes as a backup route.

12. The system of claim 11, wherein said routing logic is further operable to:

detect a failure of said enabled route; and  
replace said enabled route with said backup route.

13. The system of claim 7, wherein said routing logic comprises at least one digital logic circuit.

14. The system of claim 7, wherein said routing logic comprises program code loaded into a memory of a computer system.

15. A system for selecting routing information to be provided to devices in a communication network, comprising:

means for obtaining routing information describing a plurality of routes between forwarding devices of said

communication network, wherein said plurality of routes is deadlock free, and wherein said routing information includes a plurality of alternative routes;

means for selecting one of said plurality of alternative routes, wherein said selecting optimizes a performance metric; and

means for delivering said selected one of said plurality of alternative routes to at least one forwarding device in said communication network.

16. A computer program product including a computer readable medium, said computer readable medium having a computer program stored thereon, said computer program for selecting routing information for distribution to at least one networking device, said computer program comprising:

program code for obtaining routing information describing a plurality of routes between forwarding devices of said communication network, wherein said plurality of routes is deadlock free, and wherein said routing information includes a plurality of alternative routes;

program code for selecting one of said plurality of alternative routes, wherein said selecting optimizes a performance metric; and

program code for delivering said selected one of said plurality of alternative routes to at least one forwarding device in said communication network.